

PRECISION
EXTRACTION SOLUTIONS
By AGRIFY™

Diamond Miner
Operational Manual



Congratulations on the purchase of your new Precision® Extraction Diamond Miner! You are well on your way to a better experience in professional extraction.

Please read and understand this operational manual thoroughly prior to using your new equipment. Also visit our [YouTube channel](#) for informative videos from Precision® Extraction Solutions.

If you need further assistance, or for warranty information, please contact Precision® Extraction Solutions Technical Support directly at (855) 420-0020 ext. 2, or visit our client portal at support.precisionextraction.com.



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SAFETY FIRST!



SAVE THESE INSTRUCTIONS!

It is the owners' and operators' responsibility to read and understand the following safety information. This equipment is to be installed, operated, maintained, cleaned, and transported only by trained, qualified personnel. Follow these safety precautions to ensure the safety of persons and property. Failure to read and heed these instructions places operators, facility, and equipment at risk. Improper use could result in a serious accident. Print this section and display it where it can readily be seen by equipment operator(s).



DANGER: FIRE AND EXPLOSION HAZARD: MISUSE OF THIS EQUIPMENT CAN RESULT IN PROPERTY DAMAGE, SEVERE INJURY, OR DEATH.



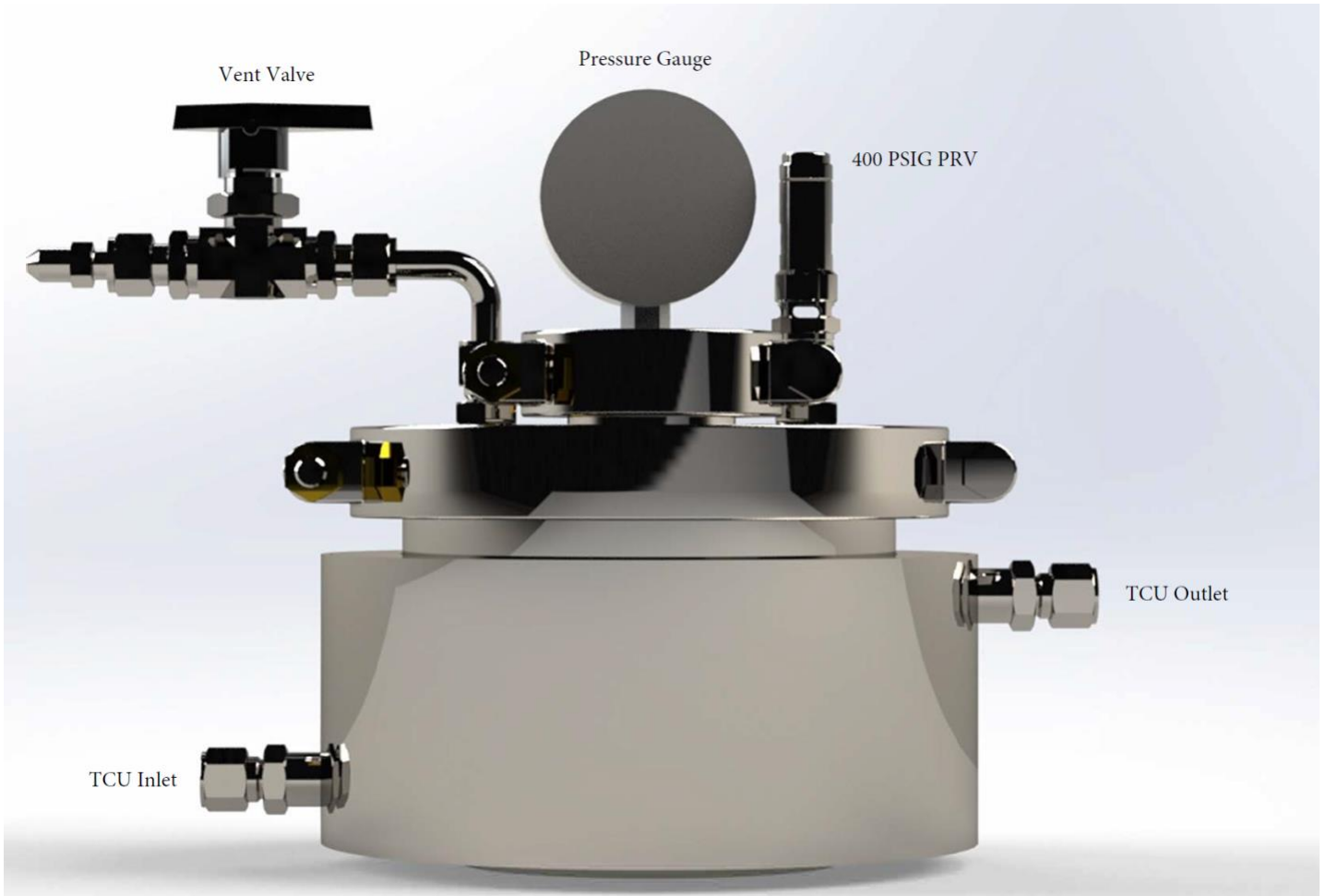
NOTE: USE OF THIS EQUIPMENT CONSTITUTES USER AGREEMENT TO UTILIZE EQUIPMENT FOR LAWFUL PURPOSES ONLY. USER ASSUMES SOLE RESPONSIBILITY FOR SAFE USE, TRANSPORT AND STORAGE OF EQUIPMENT. USER ASSUMES ALL RISK ASSOCIATED WITH EQUIPMENT USE.

WARNING!

- This equipment is intended for use with crude oil which may contain a small amount of Liquefied Petroleum Gases (LP-GAS). Equipment is not equipped with an overfill prevention device. Overfilling vessels may cause a violent rupture, resulting in severe injury or death. Take care to ensure overfilling does not occur.
- Combustible liquid-extracted cannabis plant oil is considered a Class IIIB combustible liquid, with a flashpoint exceeding 288 °C (>550 °F). Take care not to heat the diamond miner above the flashpoint of the oil. Make sure all pressure gauges read 0 PSIG before removing any clamps and verify the system is open to the atmosphere (in case of faulty gauge).
- Avoid breathing LP-GAS vapor. Breathing in vapors may cause heart arrhythmia, loss of consciousness, or even cause suffocation. Exposure may irritate the eyes, nose, throat, and skin. Please read the manufacturer's Material Safety Data Sheet for further safety information on LP-GAS and ethanol.
- Operate equipment ONLY in a facility with an approved, functional ventilation/exhaust system such as a chemical fume hood.
- Do not make any unauthorized modifications to the equipment. Do not install replacement parts that have not been approved by Precision® Extraction. Modifications, unapproved components, or improper assembly may result in noncompliance, property damage, or serious injury/death.
- Wear appropriate personal protective equipment (PPE) including safety glasses and gloves during use. Avoid contacting solvent or inhaling solvent vapors. Read the solvent manufacturer's Safety Data Sheet (SDS) for further safety information. Print and retain the solvent manufacturer's SDS on site.
- Only allow trained personnel to operate or work on the equipment. This applies to all assembly and servicing work.
- Do NOT use or store equipment or containers where they could be exposed to high temperatures. DO NOT heat equipment or containers above 52 °C (125 °F).
- Ensure the system is properly grounded to reduce the risk of static build up.
- The facility must provide adequate ventilation/exhaust as determined by the Engineer of Record to maintain the local atmosphere below 25% of the Lower Flammability Limit (LFL).
- Ensure no air is present in the inert gas push.
- Use only approved solvents.

Section 1 – Product Overview

Figure 1: Diamond Miner Front View



Section 2 – Getting Started

Review the following system installation and operation requirements information before preparing for operation. Failure to do so may result in improper/unsafe installation and/or dangerous operating conditions.

2.1. System Placement

2.1.1. The diamond miner shall be placed on a level surface in a properly ventilated area, that has been approved by your AHJ.

2.2. Mounting of Components

NOTE: Process in/out hoses should be supplied by Precision. The hose and fitting set will be tailored to the end user’s extraction system. Precision is not responsible for poor performance of the system due to improper hosing.

2.2.1. Level all components.

2.2.2. Connect hoses to heater (if applicable for your application).

2.3. Heater Options

NOTE: Any heater that is used in conjunction with the diamond miner must be NRTL listed and cannot use flammable chilling/heating media.

2.3.1. For hazardous environments (Class I, Division 1 and Class I, Division 2 locations) the liquid heat source must be plumbed into the hazardous area.

2.3.2. Confirm with Precision all heater options that are present on site so that a suitable option is used. A suitable heater may also be sourced through Precision.

2.4. Solvent Requirements

2.4.1. Use only approved solvents. Approved solvents are displayed in the following table. Never mix solvents other than what is stated below. Thoroughly clean the system before changing solvents.

Approved Solvent(s)	Operating Process Flow
Butane	Compressed N ₂ Gas
Isobutane	
Propane	
Propane/Butane Blend	

Section 3 – Pressure Testing

The diamond miner comes factory tested and inspected for sustained pressure holding capabilities. However, shipping and moving of the unit may cause pressure leaks and/or expose equipment to drastic changes in temperature. It is the operator's responsibility to check for pressure leaks prior to operation.

3.1. Checking System for Leaks

- 3.1.1. Attach all the components and hose assemblies.
- 3.1.2. With all valves on the system open, bring the system pressure to 100 PSIG using a nitrogen cylinder.
- 3.1.3. Note the actual readings of the pressure gauge by taking a photo for later comparison.
- 3.1.4. Allow the system to sit under 100 PSIG for one hour if this is a primary test (aka the first pressure test).
- 3.1.5. Take note of any difference in pressure. This indicates a leak, and that the system is therefore unsafe to operate.

3.2. Identifying Leaks

- 3.2.1. Fill a spray bottle with soapy water. Spray the area of the unit where a leak is suspected. The presence of bubbles confirms a leak.
- 3.2.2. The most common areas for leaks are the tri-clamp gasket sealing joints.
 - 3.2.2.1. Before adjusting any pieces on the unit, vent the system down to 0 PSIG.

Section 4—Preparing and Operating the Diamond Miner

Prior to use, the operator must read and be familiar with the specific operation manual of the extraction equipment. The following procedure outlines the steps to prepare to operate the diamond miner. Nitrogen gas may be required to transfer solvent between vessels. This section is meant to be the baseline information for the operator to develop their internal SOP.

- 4.1. Turn on the heater but do not start the circulator.
- 4.2. Remove the 6" clamp from the diamond miner.
- 4.3. Remove the lid from the diamond miner.
- 4.4. Harvest extract from the collection bowl.
- 4.5. Extract should be poured into the diamond miner when it is of a consistency similar to syrup.
- 4.6. Within the extract, wavy bands of THC-A should be visible in the solution.
- 4.7. Place gasket and lid back onto the diamond miner, tighten the 6" HP clamp, and ensure all valves are closed.
- 4.8. Begin circulating the heating fluid through the jacket.
- 4.9. After 2 hours under heat, the pressure should be stable. At this point "burp" pressure SLOWLY down to 20 PSIG.
- 4.10. After diamond growth has visibly slowed/halted, vent vessel to atmosphere.
- 4.11. Remove clamp, lid, and gasket.
- 4.12. Pour diamonds and sauce through strainer to separate the sauce from the THC-A.
- 4.13. Purge the THC-A separately from the sauce; the THC-A can be purged more aggressively.

Section 5—Cleaning the Diamond Miner

The system will normally need to be completely disassembled for proper cleaning in between uses. Before disassembling any components on the diamond miner, ensure the system is completely vented of pressure/solvent. Additionally, ensure all TCUs are powered off before opening tanks to atmosphere in accordance with internal procedures.

Note: When operating in a CGMP environment the operator must perform a cleaning validation in accordance with their internal procedures.

5.1. Cleaning

5.1.1. Verify vessel is completely vented in an exhausted enclosure.

5.1.2. Detach all hose connections.

5.1.3. Remove the clamps one at a time.

5.1.4. Pour off your material into a desired container.

5.1.4. Using a stainless-steel food grade cleaning agent, wipe and clean all surfaces of the diamond miner.

Note: Additional cleaning solutions may be used after proper evaluation.

5.1.4. Using a food grade cleaning agent that is compatible for use with the gasket material, wipe and clean the gaskets.

5.1.5. Allow all components to completely dry.

Note: This process can be accelerated by reassembling and pulling vacuum on the system.

5.1.6. Install the clamps.

5.1.7. Reattach all heater connections if necessary.

Section 6—Periodic Maintenance

Periodic maintenance is essential to the safe and proper operation of your equipment. Contact Precision directly for replacement components. Obtaining replacement components from a third party will void your warranty and invalidates the engineering peer review of the equipment.

Use ONLY approved, food-safe cleaners, solvents, and sanitizers for cleaning. Conduct cleaning activities in an area with adequate ventilation or under a fume hood.

The wear on the individual machine components varies greatly depending on the amount of usage in a timeframe. Always replace worn components immediately. It is EXTREMELY IMPORTANT to inspect all nuts, bolts, and gaskets before every use of the system. If there is any question as to the integrity of any given component, replace it immediately.

Action	Frequency
Inspect all seals, nuts, bolts and gaskets. If damaged, replace.	Before every use
Inspect sanitary clamp bolts/nuts.	Every use or at first visible sign of wear
Inspect gaskets for visible signs of wear. Retighten if necessary.	Every use or at first visible sign of wear
Perform a complete system cleaning.	After each use
Ensure pressure relief valves perform as intended. Replace as needed.	Monthly
Inspect the ball valves. Replace as needed.	Annually
Inspect the quick connects. Replace if damaged.	Annually
Inspect the sight glass for signs of damage or wear. Replace as needed.	Periodically
Clean the surface of the sight glass using a standard commercial cleaner and a soft cloth.	Periodically
Inspect the high-pressure clamp and ensure the two segments have a gap between them and the inside diameter is not touching the outside diameter of the hub.	Periodically
Check the Clamp locking nuts are tight to prevent the nuts from loosening.	Periodically
Visually check the pressure gauge display and function for damage at regular intervals in line with the operating conditions and ambient conditions.	Periodically
Clean the pressure gauge with a non-aggressive cleaning agent when cleaning. Close the ventilation valve in accordance with the protection category of the device.	Periodically

APPENDIX A—Facility Requirements

The local Authority Having Jurisdiction (AHJ) must approve installation of this equipment. The AHJ will determine the facility requirements for the operation of extractors.

8.1. Minimum Requirements

- 8.1.1. Use adequate ventilation/exhaust determined by the Engineer of Record to maintain the local atmosphere below 25% of the Lower Flammability Limit (LFL) for solvent.
- 8.1.2. Design exhaust systems in accordance with the International Mechanical Code. Exhaust systems shall be ON whenever LP-GAS is stored or used in the extraction area.
- 8.1.3. Locate supplemental equipment within another room.
- 8.1.4. Use a hydrocarbon meter that alarms at or below 25% of the LFL in the extraction area. Install the detector 12-18 inches from the floor level to detect heavy hydrocarbon gases. A qualified individual should install and calibrate the detector to the appropriate solvent used at least annually.
- 8.1.5. Open the collection bowl or collection pot to remove the product within a fume hood or in an area that provides adequate ventilation/exhaust to maintain the local atmosphere below 25% of the LFL as determined by the Engineer of Record.

8.2. OSHA Standards in the Workplace

- 8.2.1. If using this system in a workplace setting, be aware that it is the responsibility of the employer to furnish a workplace which is free from recognized hazards that cause or are likely to cause death or serious physical harm to employees.
- 8.2.2. Review Occupational Health and Safety Administration (OSHA) standards for site-specific applicability prior to the operation of this system. They include (but are not limited to):
 - 8.2.2.1. 40 CFR § 1910.22 – General requirements for housekeeping and aisles/passageways
 - 8.2.2.2. 40 CFR § 1910.38-39 – Emergency Action and Fire Prevention Plans
 - 8.2.2.3. 40 CFR § 1910.101 – General requirements for the use of compressed gases
 - 8.2.2.4. 40 CFR § 1910.110 – Storage and handling of Liquefied Petroleum Gases (LP-GAS)
 - 8.2.2.5. 40 CFR § 1910.132-138 – Personal Protective Equipment (PPE)
 - 8.2.2.6. 40 CFR § 1910.144-145 – Specifications for marking physical hazards and accident prevention signs and tags
 - 8.2.2.7. 40 CFR § 1910.147 – Control of hazardous energy (lockout/tag out)
 - 8.2.2.8. 40 CFR § 1910.151 – Medical services and first aid
 - 8.2.2.9. 40 CFR § 1910.157 – Portable fire extinguishers
 - 8.2.2.10. 40 CFR § 1910.1000 – Control of occupational exposure to air contaminants (e.g. solvents)
 - 8.2.2.11. 40 CFR § 1910.1200 – Hazard communication

APPENDIX B—Assembly Requirements

To ensure the sanitary clamps and gaskets are properly sealed, the bolts/nuts must be properly torqued. Always torque sanitary clamps to the material manufacturer’s specifications listed below. Never overtighten.

Clamp Size	Part Number	Manufacturer Torque Spec.
0.5" HP	CL-13MHP-0.5	Nuts to 20 foot-pounds
1" HP	CL-13MHP-1.0	Nuts to 20 foot-pounds
2" HP	CL-13MHP-2.0	Nuts to 20 foot-pounds
4" HP	CL-13MHP-4.0	Nuts to 20 foot-pounds
6" HP	CL-13MHP-6.0	Nuts to 20 foot-pounds

WARRANTY INFORMATION

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